Increasing Learning and Decreasing Costs in a Computer Fluency Course

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Project Goals

- Redesign a course to
  - Increase learning
  - Decrease costs
- Redesign in a generic way
  - Ensure that mechanisms are not course or discipline specific
- Target: CSE101, a computer fluency course

Relationship Between Technology and Learning

Pedagogy	Technology: Low	Technology: High
Passive	Lectures	Distance Learning
Active	Project-based	Project-based, simulations, ...

Pew Program Redesign Process

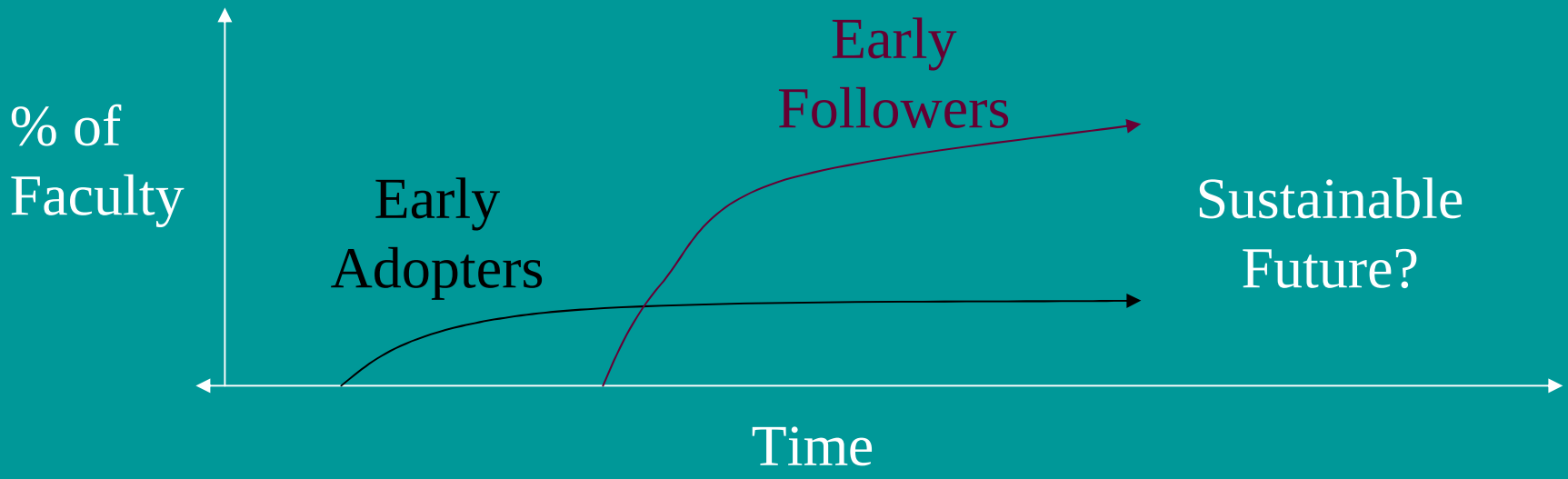
- Pedagogical considerations had top priority
- Cost considerations provided constraints
- Considering both forced new ways of thinking about teaching/learning
- “Out-of-the-box” solutions emerged

- Early Followers versus Early Adopters

Early Adopters, Early Followers

Requirements for e-Learning Environments:

- Physical infrastructure
- Technical support infrastructure
- Course management software
- Course specific e-Learning materials



The Course

- CSE 101 - Computers: An Introduction
  - Computer fluency course for non-majors
  - 800 students annually
- Learning Goals
  - "What should everyone know about IT?"
  - Ten learning goals in each of three areas:
    - Skills
    - Concepts
    - Critical thinking

Most Important Goal

- Improve Student Learning
  - Decrease passive learning and increase active learning
  - Provide multiple learning environments
  - Provide more individualized face-to-face instruction
  - Use better assistants

	Traditional Course	Redesigned Course
Lectures	3 hours	2 hours
200 per section		
Labs	2 hours	3 hours
20-25 per section		
Optional lab prep	none	1 hour
Lab classroom	department	university
eLearning materials	no	yes
Assistants	GTAs (1)	ULAs (2)

e-Learning Materials

- Customized concepts textbook and web-site
- Customized skills textbook with web-site
- Concepts lab CD-ROMs and web-sites
- Skills training CD-ROMs and web-sites
- e-Testing

Outcomes

We had two main goals

- decrease costs
- increase learning

Prior cost analysis reassured us we would realize a cost savings, if enrollments remained high.

The learning outcome was less certain.

Cost Savings

- Recoverable Cost Savings
  - Replacing GTAs with ULAs
- Unrecoverable Cost Savings
  - Faculty time
  - Technical staff time

Recoverable Cost Analysis

	Enrollment	Total Recoverable Cost	Recoverable Cost per Student
Traditional	802	$141,714	$177
Redesign	719	$ 62,216	$ 87
SAVINGS			$ 90

Unrecoverable Cost Analysis

	Enrollment	Total Unrecoverable Cost	Unrecoverable Cost per Student
Traditional	802	$ 57,988	$ 72
Redesign	719	$ 58,143	$ 81
SAVINGS(?)			- $ 9

Cost Summary

	Traditional	Redesign	Savings
Cost	$ 249	$ 167	$ 82

Grade Analysis

	Completion (F or higher)	Retention (C or higher)	Very good (A- or higher)	Mean grade
Traditional	93%	75%	37%	2.80
Redesign	92%	78%	41%	2.90

Competency-based Assessment (mean score)

	Traditional (Fall 2000)	Redesign (Fall 2001)
Pre-test mean score	n.a.	30%
Post-test mean score	69%	65%

Computer Attitude Survey

	Traditional (Fall 2000)	Redesign (Fall 2001)
Pre-test mean score	2.45	1.97
Post-test mean score	2.04	1.99

Implementation Issues

- What worked best?
  - The ULAs
  - The move from fewer lectures to more labs
  - The e-Learning materials
- What was problematic?
  - The e-Learning materials
- Hypothesis: Time is right for early followers in computer fluency

To Learn More

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- Email
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